



[Introduction to R Software]

SWAYAM Prabha Course Code-G2

PROFESSOR'S NAME	Dr. Shalabh
DEPARTMENT	Department of Mathematics & Statistics
INSTITUTE	Indian Institute of Technology Kanpur
COURSE OUTLINE	What is R, What is R and how to install it, How to use help, demonstration, examples, packages and libraries UG students of Science and Engineering. Students of humanities with basic mathematical background can also do it. Working professionals in analytics and anyone involved in programming, mathematical and statistical computations, simulations and data analysis can also do it.

COURSE DETAILS

S. No	Module ID/ Lecture ID	Lecture Title/Topic
1	L1	Why R
2	L2	Installation Procedure and How to Start
3	L3	Help, Demonstration, and Examples
4	L4	Command line, Libraries, Packages and Data Editor
5	L5	Introduction to R Studio
6	L6	Basics of Calculations and R as a Calculator
7	L7	R as a Calculator with Data Vectors
8	L8	R as Calculator, Built-in Functions and Assignments
9	L9	Functions and Introduction to Matrix
10	L10	Matrices
11	L11	Matrix Operations
12	L12	Matrix Operations and Missing Data
13	L13	Missing Data and Logical Operators
14	L14	Logical Operators: More Operations

15	L15	Truth Table and Conditional Executions
16	L16	Loops
17	L17	Repeat Loop and Sequences of Numbers
18	L18	Sequences of Dates and Alphabets
19	L19	Repeats, Sorting and Mode
20	L20	Ordering and Lists
21	L21	Vector Indexing
22	L22	Data Frames
23	L23	Data Frames: Creation and Operations
24	L24	More Operations on Data Frames
25	L25	Display using Print and Format Functions with Concatenate
26	L26	Display Strings Using Paste Function and Splitting
27	L27	Splitting and Substitution in Strings
28	L28	Search in Strings and Other Data Operations
29	L29	Factors
30	L30	Factors – Examples and Operations
31	L31	Importing, Reading and Saving Data Files
32	L32	Importing and Reading Data Files
33	L33	Introduction and Frequencies
34	L34	Partition Values, Graphics and Plots
35	L35	Graphics, Plots and Central Tendency of Data
36	L36	Central Tendency and Variation in Data
37	L37	Boxplots, Skewness and Kurtosis

38	L38	Bivariate and Three Dimensional Plots
39	L39	Programming in R
40	L40	More Examples of Programming

References if Any:

List of reference material/ books:

1. Introduction to Statistics and Data Analysis - With Exercises, Solutions and Applications in R By Christian Heumann, Michael Schomaker and Shalabh, Springer, 2016
2. The R Software-Fundamentals of Programming and Statistical Analysis -Pierre Lafaye de Micheaux, Rémy Drouilhet, Benoit Liquet, Springer 2013
3. A Beginner's Guide to R (Use R) By Alain F. Zuur, Elena N. Ieno, Erik H.W.G. Meesters, Springer 2009